

Science- Year 7

Year 7		HT1	HT2	HT3	HT4	HT5	HT6
	Topic	Introduction to Science – Safety and skills Particle Model and Energy	Cells Mixtures	Forces Muscles and Bones	Atoms, elements and compounds Sexual Reproduction	Sound Ecosystems	Current Electricity Acids and Alkalis
subject	Why this and why now?	Safety and Scientific enquiry- To ensure the fundamental skills needed to support all future learning and develop scientific enquiry for KS3 Particles and energy- as everything is made up of matter to access other units students need to master that the world is made up of particles and change state only by energy, this is the foundation topic that other topics in the year will build up on.	Cells- make up all living things both unicellular and multicellular, which is needed for all other biology units. As students understand particles and energy this will help with their learning on cells. Mixtures- as students understand how particles exist, they can access learning on mixtures or pure substances and how these mixtures can be separated using different techniques, which is needed for chemistry units to be able to build on the key concepts.	Forces- builds on previous learning on energy, as it will allow student to learn that particle forces can be overcome by certain energy building on HT1. Muscles and bones- uses knowledge from cells; cells make up muscle and bone tissue. Students understand how body systems, organs and cells can be affected by taking drugs, building on HT1.	Atoms, elements and compounds- builds upon particles to introduce atoms. A firm understanding and knowledge of atoms, elements and compounds is needed to understand chemical reactions, which links onto Acids & Alkalis. Sexual Reproduction builds upon the cells topic eg gametes as they are specialised cells building on cells in HT1	Sound - builds on the both the waves unit and states of matter through learning about the properties of sound waves in different states of matter, this continues to build on from particles. Ecosystems - Builds on prior learning of variation and adaptation in KS2 and introduces the fundamental idea that organisms are dependent on each other.	Current Electricity Builds on KS2 knowledge of basic electricity, extending this to parallel circuits. This builds on from the energy topic – electrical stores Acids and Alkalis - builds on separating mixtures and uses the prior learning in the new context of acids and alkalis. This topic builds on HT4 chemistry topics.

<p>What is the essential knowledge that needs to be remembered?</p>	<p>Particle Model: the three states of matter, in terms of shape, volume and compressibility; diffusion and Brownian motion. Energy: stores of energy are needed to make most things happen; food, energy stores and transfers, and energy resources (non-renewable fuels and renewable resources)</p>	<p>Cells: features of organisms, organs, tissues and cells, in the context of organ systems. Mixtures: mixture & solution; what separation techniques are in the context of providing clean drinking water.</p>	<p>Forces: concepts and types of forces and their effects. Force calculations. Knowledge of friction, gravity and springs. Muscles and Bones; the gas exchange system, the circulatory system and the locomotor system. The various effects of drugs on these systems and on the nervous system.</p>	<p>Atoms, elements and compounds: differences between atoms, and molecules, elements and compounds. Symbols and formulae for elements and compounds. Sexual Reproduction the structure and function of the male/female reproductive systems, menstrual cycle, gametes, fertilisation, gestation and birth, effect of maternal lifestyle on the foetus.</p>	<p>Sound how sounds are made, transmitted and detected, some uses of sound and compares sound waves with waves on the surface of water. Ecosystems the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops</p>	<p>Current Electricity electric current, measured in amperes, in circuits, series and parallel circuits and the domestic ring main Acids and Alkalis chemical reactions using formulae, using equations, defining acids and alkalis in neutralisation reactions, pH scale for measuring acidity/alkalinity; and indicators, reactions of acids with alkalis. Review of year 7</p>
<p>What is the assessment intent and how will you assess?</p>	<p>Year 7 Baseline – this assesses Science knowledge, skills and understanding from KS2 to inform Year 7 teaching. Assessment 1 – is used to assess how science works skills and is made from past SAT questions</p>	<p>Assessment 2 – a cumulative assessment that uses questions based on all topics taught so far. Extended answer questions as well as short answer, discuss and compare questions. End of topics test to be set in class, active learn tasks to be set for homework which are low stake quizzes, as well as weekly memory retrieval quizzes in lessons to identify any gaps or weaknesses</p>	<p>End of topics test to be set in class, active learn tasks to be set for homework which are low stake quizzes, as well as weekly memory retrieval quizzes in lessons to identify any gaps or weaknesses</p>	<p>Assessment 3 - a cumulative assessment that uses questions based on all topics taught so far. Extended answer questions as well as short answer, discuss and compare questions. End of topics test to be set in class, active learn tasks to be set for homework which are low stake quizzes, as well as weekly memory retrieval quizzes in lessons to identify any gaps or weaknesses</p>	<p>End of topics test to be set in class, active learn tasks to be set for homework which are low stake quizzes, as well as weekly memory retrieval quizzes in lessons to identify any gaps or weaknesses</p>	<p>Assessment 4 – a cumulative assessment that uses questions based on all topics taught so far. Extended answer questions as well as short answer, discuss and compare questions. End of topics test to be set in class, active learn tasks to be set for homework which are low stake quizzes, as well as weekly memory retrieval quizzes in lessons to identify any gaps or weaknesses</p>
<p>What should the</p>	<p>Describe and explain the arrangement and energies of particles in different</p>	<p>Compare eukaryotic and prokaryotic cells or compare specialised cells from plants</p>	<p>Identify key components of tissues (blood), bones and the muscles. Explain and</p>	<p>State the concept of a pure substance, mixtures, dissolving, the</p>	<p>Identify how sound travels, is measured and how the speed</p>	<p>Current & electricity: State what current is and how it is measured, the</p>

<p>end point look like?</p>	<p>states of matter, which is applied to changes of state, properties of materials & diffusion etc. How energy is transferred from one store to another via a pathway. Use of the conservation principle of energy and use simple equations to calculate efficiency. Key scientific enquiry skills (identification of variables, drawing conclusions and analysing data, equipment, assessing risks and evaluation are retained.</p>	<p>& animals relating their special features to their location and the job they do. Identify, describe & explain the differences between element, compound or mixture, and apply this knowledge to diagrams. Independently write methods to successfully separate mixtures, based on solubility, boiling point and soluble mass.</p>	<p>identify how tissues function e.g. how antagonistic pairs work to cause movement at a joint and how components of the blood function and apply this. Identify, explain and apply knowledge on forces, e.g. by annotating diagrams showing pushes or pulls, the interactions of two objects, balanced & unbalanced forces as well as forces that are associated with deforming objects. State that forces are measured in Newton's and use Hooke's law to independently draw and discuss graphs involving simple Maths skills</p>	<p>differences between atoms, elements and compounds, use chemical symbols/formulas, combustion, thermal decomposition, oxidation & displacement reactions and be able to state chemical & physical properties of different elements. Explain how reproduction in mammals occurs, including structure & function of the male & female reproductive systems, menstrual cycle, gametes, fertilisation and birth & effect of maternal lifestyle on the foetus.</p>	<p>changes dependent upon the medium. Can apply their knowledge e.g. how sound is produced and detected by their ears or a microphone, as well as uses for these types of waves. Ecosystems: State the interdependence in an ecosystem e.g. in a food web, how this might be affected by the environment e.g. toxins. Differences between species & discuss variation being continuous and discontinuous. Apply and discuss what natural selection is and give examples, linking this to maintaining biodiversity.</p>	<p>difference between parallel and a series circuit, what potential difference is and resistance. Be able to independently apply their knowledge to models. Acids & alkalis: State reactions are a rearrangement of atoms, use formulae and equations to represent reactions, define an acid/alkali, the term neutralisation and pH scale. Apply their knowledge to reactions of acids and alkalis to produce a salt and water.</p>
<p>How does it cover the NC</p>	<p>'Working scientifically' skills Particle Model: 'The particulate nature of matter'. Some of 'Pure & impure substances' (diffusion). 'Scientific Attitudes'; 'Experimental skills' & 'Analysis & evaluation' Energy: 'Calculation of fuel uses and costs in the domestic context'. 'Changes in systems'</p>	<p>Cells: 'Cells & organisation' & 'Experimental skills & investigations' (appropriate equipment) Mixtures: 'Pure and impure substances' & 'Experimental skills & investigations'</p>	<p>Forces: 'Forces', 'Pressure in fluids', 'Balanced forces', 'Forces & motion' & 'Measurement'. Muscles and Bones 'Gas exchange systems', 'The skeletal & muscular systems', 'Health' & 'Experimental Skills & investigations.'</p>	<p>Atoms, elements and compounds: 'Pure & impure substances', 'Atoms, elements & compounds', 'Chemical reactions' 'The periodic table' 'Earth & the atmosphere'. In physics 'Physical changes' & 'Particle model' Sexual Reproduction 'Reproduction', 'Scientific attitudes', 'Experimental skills & investigations'</p>	<p>Sound 'Analysis & Evaluation', 'Observed waves', 'Sound waves', 'Energy & waves' Ecosystems 'Relationships in an ecosystem' some of 'Inheritance, chromosomes, DNA & genes', 'Analysis & evaluation'</p>	<p>Current Electricity 'Current Electricity' & 'Measurement' Acids and Alkalis 'Scientific attitudes', & 'Chemical attitudes'</p>